

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

In the specification, paragraphs have been amended on page 8.

New claims 51-53 have been added.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

The disclosure of Applicant's application provides support for the amendments to the claims. For example, at least page 9, line 20, to page 10, line 12, of Applicant's specification provide support for the amendments to claims 26 and 38.

After amending the claims as set forth above, claims 26-53 are now pending in this application.

Objection to the Specification

The specification is objected to for containing informalities. Applicant respectfully submits that the amendments to the specification render this objection moot. Reconsideration and withdrawal of this objection is respectfully requested.

Rejections under 35 U.S.C. § 112

Claims 26, 29-33, 35, 38, 45, and 46 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Applicant respectfully submits that the amendments to the claims render these rejections moot. Reconsideration and withdrawal of these rejections is respectfully requested.

Rejections under 35 U.S.C. § 102

Claims 26-50 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by JP 02-059092 to Kiozumi *et al.* (hereafter “Kiozumi”). This rejection is respectfully traversed.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See generally MPEP § 2131.

Kiozumi discloses an apparatus for treating waste oil in waste water that includes a high voltage electrode 16 opposed to an earth electrode 14 arranged in water, with the electrodes 16 and 14 creating a dielectric discharge with a water and oil film 2 and air presented between the electrodes 16, 14. See abstract of Kiozumi.

However, the apparatus of Kiozumi does not include a reactor configured such that fumes introduced into the reactor are degraded by active species generated in the reactor by air introduced through at least one dielectric discharge member, such that the fumes do not directly contact the at least one dielectric discharge member, as recited in claims 26 and 38. Claims 27-37 and 38-50 depend from claims 26 and 38.

Instead, the device of Kiozumi is configured such that fumes introduced into the device come into direct contact with the electrodes 16, 14, as shown in the drawings of Kiozumi. In addition, the device of Kiozumi is for treating waste oil, not fumes generated during production, conversion and/or handling of heated products of petroleum origin.

Applicant’s invention advantageously generates active species by introducing air through at least one dielectric discharge member and into a reactor so that the active species are mixed with fumes to be treated, which can contain volatile organic compounds (VOC). This causes chemical modification of the fumes to be treated due to the mixing and reaction of the fumes with the active species generated in the reactor. For example, the active species can contain free radicals that lead to polymerization of free radical organic molecules. This is

accomplished without direct contact between the fumes and the at least one dielectric discharge member. As discussed on page 2, lines 21-37; page 3, lines 1-7; and page 9, line 35, to page 10, line 12, Applicant's invention advantageously treats lighter and heavier species of fumes, including fumes generated during the production, conversion, and/or handling of heated products of petroleum origin. Further, introducing air through a dielectric discharge member to produce active species and then mixing the active species of the air with fumes such that the fumes do not directly contact the dielectric discharge member advantageously minimizes or prevents deposits and buildup on the dielectric discharge member and promotes mixing of the active species and fumes so that treatment and degradation of the fumes is in turn promoted.

For at least the reasons discussed above, Kiozumi does not anticipate claims 26-50 because Kiozumi does not disclose all of the features of claims 26 and 38. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 26-50 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Pub. No. 2002/0074221 to Mallinson *et al.* (hereafter "Mallinson"). This rejection is respectfully traversed.

Mallinson discloses a gas stream conversion apparatus 10 that includes first and second electrodes 30, 40. See Mallinson at paragraph 0056-0058. However, as shown in Figures 1A-2B of Mallinson, the electrodes 30, 40 do not form at least one dielectric discharge member arranged close to at least one of the reactor walls which extend parallel to a flow direction of the fumes passing through a reactor, as recited in claims 26 and 38, because the electrodes are arranged transverse to the stream of gas flowing through the gas stream conversion apparatus 10 of Mallinson.

Mallinson further discloses devices that include a first outer plate 320, a second outer plate 320, a first electrode 330, and a second electrode 340, with the first electrode 330 and the second electrode 340 being spaced apart to provide a reaction zone 390 between the electrodes where plasma discharge occurs. See Mallinson at paragraphs 0081-0094. However, these devices are not reactors configured such that fumes introduced into the

reactors are degraded by active species generated in the reactors by air introduced through at least one dielectric discharge member, such that the fumes do not directly contact the at least one dielectric discharge member, as recited in claims 26 and 38. Instead, as shown in Figures 5-8 of Mallinson, gases passing through the device of Mallinson would come into direct contact with at least one of the first electrode 330 and second electrode 340.

Furthermore, the device of Mallinson does not introduce air through at least one dielectric discharge member, as recited in claims 26 and 38. Mallinson is silent in regard to this feature. Instead, the device of Mallinson flows gases past and over the surfaces of electrodes of the device such that the gases come into direct contact with at least one electrode but Mallinson does not disclose that air is introduced through a dielectric discharge member, as recited in claims 26 and 38.

Further, the device of Mallinson is a very small reactor that treats light gases such as methane, not fumes generated during production, conversion and/or handling of heated products of petroleum origin.

For at least the reasons discussed above, Mallinson does not anticipate claims 26-50 because Mallinson does not disclose all of the features of claims 26 and 38. Reconsideration and withdrawal of this rejection is respectfully requested.

New Claims

New claims 51-53 have been added. Claims 51-53 depend from claims 26 and 38 and are allowable over the prior art for at least the reasons discussed above and for their respective additional recitations.

Conclusion

Applicant submits that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 3-Sep-2010

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